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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/619,934

07/15/2003

Yasuo Okada

6832

26021

7590

12/17/2004

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LOS ANGELES, CA 90071-2611

EXAMINER

LEE, HSIEN MING

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 12/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/619,934

Applicant(s)

OKADA, YASUO

Examiner

Hsien-ming Lee

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-24 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to:
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

HSIEN-MING LEE
PRIMARY EXAMINER

12/14/2004

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Remarks

1. Applicant's cancellation to claims 1-16 is acknowledged. Claims 17-25 are newly added.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 17-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wada et al. (US 6,613,636) in view of Kim et al. (US 2001/0005626).

In re claim 17, Wada et al., in Figs. 2(a)~2(d) and related text, teach the claimed manufacturing method of a semiconductor device including at least two MISFETS, one of which is a P-type MISFET and the other of which is an N-type MISFET, the method comprising:

- forming a buried insulating film 2 in a semiconductor substrate 1;
- forming n-type MISFET and p-type MISFET isolated by the buried insulating film 2 , wherein the MISFETS comprises electrode stack 5/6/7/8/9 and sidewalls 10/11/12 (col. 6, lines 49-55); and
- cleaning a surface side of the semiconductor substrate with a cleaning solution using a mixed solution of HF (hydrogen fluoride), acetic acid and water (col. 7, lines 30-37).

Wada et al. do not teach covering a surface side of the buried insulating film with a protective film before cleaning the surface side of the semiconductor substrate, wherein the protective film is resistant to the cleaning solution.

Kim et al., however, in an analogous art of protecting trench isolation, teach forming the protective film 23 (i.e. silicon nitride, paragraph [0033]) for protecting the underlying buried insulating film (i.e. trench isolation 22) from over etching (Figs. 2E~2F).

Therefore, it would have been obvious to one of the ordinary skill in the art, at the time of the invention was made, to combine Wada et al. with Kim et al. so that the protective film (silicon nitride) as taught by Kim et al. is formed on the buried insulating film 2 of Wada et al. before performing the cleaning step, since by this manner it would prevent the buried insulating film from over etching.

In re claims 18-19, Wada et al. teach using HF for cleaning (col. 7, lines 30-37).

In re claims 20-21, Wada et al. in view of Kim et al. teach that the protective film is resistant to HF because the protective film 23 of Kim et al. is made of silicon nitride (paragraph [0033]).

In re claim 22, Wada et al. in view of Kim et al teach that the sidewall and the protective film are the same material because the sidewall film 11 of Wada et al. is made of silicon nitride and the protective film 23 of Kim et al. is made of silicon nitride as well.

In re claim 23, Wada et al. teach a desirability of forming a silicide on the substrate (col. 7, line 60 and col. 8, line31). Therefore, it would have been obvious to one of the ordinary skill in the art, at the time of the invention was made, to form a silicide, which is equivalent to salicide metal layer, on the gate electrode, a source diffusion and a drain diffusion region of the MISFETS, since by this manner it would improve the conductivity of the MISFETS.

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In re claim 24, one of the ordinary skill in the art would have been motivated to form the protective film over the source and drain diffusion regions 3 of n-type MISFET and the p-type MISFET of Wada et al, since by doing so it would prevent the diffusion regions from undesirable over etching during the cleaning step.

Allowable Subject Matter

4. Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter:

Wada et al. and Kim et al. do not teach or suggest forming a *wiring layer* on the protective film and is electrically connected to the diffusion region of the p-type MISFET and the n-type MISFET.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-ming Lee whose telephone number is 571-272-1863. The examiner can normally be reached on Tuesday-Thursday (8:00 ~ 6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hsien-ming Lee
Primary Examiner
Art Unit 2823

Dec. 14, 2004

HSIEN-MING LEE
PRIMARY EXAMINER

Lu
12/14/2004